4. Mechanical Construction: All transformer enclosures, incoming sections, and outgoing sections shall have completely enclosed sheet metal bottoms. All side panels shall be removable. The ventilated enclosure shall be of heavy gauge sheet steel, and be suitable for outdoor or indoor operation.

   Each transformer enclosure shall be gasketed and shall be provided with tops and shields required to prevent falling or dripping water from entering the enclosure. Each transformer enclosure, both interior and exterior shall be thoroughly cleaned, then given a rust-resisting primer coat and two (2) or more finish coats of enamel. The Proposal shall include a complete description of the paint system.

   External lifting eyes, or other means acceptable to IPSC for handling of the complete transformer assembly, shall be furnished as part of each enclosure framework so during movement of the unit its core and coils remain completely protected from damage or shifting.

   The unit(s) shall also be constructed and supported so movement in any direction on rollers will not damage or permanently distort the enclosure, frame, or internal apparatus.

5. Core and Coil Assembly: The core and coil assembly shall be adequately braced to withstand short-circuit forces without damage or displacement, limited only by the transformer impedance. The assembly shall also withstand normal moving and handling without the use of special shipping braces. Verification that short-circuit withstand tests have been performed on a prototype or identical transformer design shall be submitted.

   The core and coil assembly shall rest on vibration dampers designed to isolate core vibration from the enclosure.

   The core shall be constructed of high-grade grain oriented silicon steel.

   Standard values of impedance shall be used, unless otherwise required for the VFD system.

   The basic impulse insulation level shall be inherent to the design, and is to be obtained without the use of supplemental surge arresters.

6. De-Energized Taps: The high-voltage winding shall have four (4) approximately 2-1/2 percent rated full capacity de-energized taps, two (2) above and two (2) below rated primary voltage. A different tap setting is acceptable, if required, for the VFD system. The tap connections shall be bolted, flexible jumper, or rigid bar-type, easily accessible

by removal of one (1) of the enclosure side panels. The tap position indicator and terminal markings shall be clearly visible and identical with those used on the transformer nameplate.

7. Forced Cooling: If a forced cooled rating is specified in the Technical Data, Article 15 of this Division, the transformer shall be furnished with a complete forced air cooling system, including cooling fans, fan support brackets, winding temperature controls, fan power supply transformers, circuit protective devices, wiring, terminal blocks, and control panel. The fan power supply transformers shall be factory wired to the low voltage side of the transformer. All current carrying parts shall be sized for the maximum FA rating.

8. Accessories: Each transformer shall be furnished with the manufacturer's standard accessories including the following:

   a. Two (2) grounding pads.

   b. Stainless steel diagrammatic nameplate.

   c. Provisions for lifting and jacking, mounted on the transformer enclosure.

   d. Digital winding temperature indicator.

   Two (2) sets of SPDT alarm contacts and one (1) SPDT trip contact shall be furnished on the digital winding temperature indicator. All contacts shall be wired to identified terminal points in the control compartment.

   All accessories shall be clearly identified and described in the Proposal.

9. Termination Compartments: Each transformer shall include HV and LV termination compartments if the transformers are not an integral part of the VFD lineup, in accordance with the following:

   a. HV Compartments: HV termination compartments shall be of the type specified in this Division and in accordance with the following paragraphs:

      (1) The compartments shall be metal-enclosed air insulated terminal chambers with gasketed and bolted covers.

      (2) The compartments shall be large enough to accommodate working space for field installation of stress cones on HV cables that are shielded and to house other accessories specified, such as surge arresters.

(3) Enclosures shall be fabricated of electro-galvanized sheet steel or aluminum and painted in accordance with these Specifications.

(4) Indoor enclosures shall be dust-tight and impervious to dripping or falling water. Hardware shall be stainless steel or cadmium plated steel.

(5) All exterior hardware for units located outdoors shall be stainless steel.

b. LV Compartments: LV termination compartments shall be of the type specified in this Division and in accordance with the following:

(1) The compartments shall be metal enclosed air insulated terminal chambers with gasketed and bolted covers.

(2) Enclosures shall be fabricated of electro-galvanized sheet steel or aluminum and painted in accordance with these Specifications.

(3) Indoor enclosures shall be dust tight and impervious to dripping or falling water. Hardware shall be stainless steel or cadmium plated steel.

(4) All exterior hardware for units located outdoors shall be stainless steel.

(5) Terminal compartments shall be one of the following:

(a) Terminal compartments being provided that are "throat" connected to LV equipment shall be designed to connect directly to the specified equipment to form a complete assembly. All required hardware, bus splice plates, flexible connectors, etc., shall be provided.

(b) Terminal compartments being provided that are connected to LV bus duct shall be designed to connect directly to the specified bus duct to form a complete assembly. All required flanges, gaskets, hardware, bus splice plates, flexible connectors, etc., shall be provided.

(c) Terminal compartments being provided that are connected to LV cables shall be designed to accommodate field installation of the size and number of cables specified from the direction indicated in this Division.

10. Factory Testing: Each transformer shall be completely assembled and tested at the factory in accordance with applicable standards and the manufacturer's standard practices, using materials and equipment that will be a part of the final assembled unit and receive the routine and design tests as indicated by the latest revision of the applicable standard. Certified test reports shall be supplied, summarizing the results of all tests. In particular, the calculated hottest spot temperature rises of the primary and secondary windings shall be shown.

    Hottest spot temperature rises shall conform to the appropriate standard and shall be calculated using mathematical models verified by thermal tests on test windings and/or a prototype transformer representative of the design family. Tests shall have been conducted at conditions of full load or conditions simulating full load. Complete data shall be available for IPSC's review.

    IPSC reserves the right to witness factory testing and shall be informed in writing at least ten (10) calendar days prior to the scheduled starting date of tests so that arrangements can be made for a representative to be present.

11. Scope of Supply: Input isolation transformers shall be provided for configurations in which existing transformers are not suitable. These are not required on drives which include integral input transformers.

12. Schedule of Contract Submittals:

Submittal Item Activity	**To Be Received No Later Than ... Days After Award of Contract**
Outline Drawings	15
Schematic and Wiring Diagrams	30
Nameplate Drawings	15
Design Data and Performance Curves	15
Certified Test Reports	15 Days After Tests Are Completed

13. Performance and Design Technical Requirements:

Performance and Design Technical Requirements	
Transformer Name	VFD Input Transformer
Transformer-Type	Dry
ID Number	1CCE-XF-1A1 1CCE-XF-1B1 1CCE-XF-1C1 1CCE-XF-1D1 1CCE-XF-1A2 1CCE-XF-1B2 1CCE-XF-1C2 1CCE-XF-1D2
Quantity	1 Each
Standard	ANSI/IEEE C57
Self-Cooled Rating Capacity	As Required kVA
Force-Cooled Rating Capacity	Provisions kVA
Primary Voltage	6,900 Volts
Secondary Voltage	As Required Volts
Primary Insulation	45 kV BIL
Secondary Insulation	Full kV BIL
Primary Winding	Wye
Secondary Winding	Wye-Grounded/Delta
Primary Termination Compartment	Yes
Secondary Termination Compartment	Yes
Frequency	60 Hz
Number of Phases	3
Average Winding Rise	115°C
Cooling Class	FA or OA/AA

Performance and Design Technical Requirements	
Enclosure-Type	NEMA 1
Vector Relationship	24 Pulse
HV De-Energized Taps	± 2 X 2.5%
Sound Level	75 dBA
IPP Job Site Altitude	4,700 ft
Impedance	As Required %Z at Self-Cooled Rating
Maximum Ambient Temperature	50°C
Maximum Monthly Average Ambient Temperature	30°C
Average Annual Ambient Temperature	20°C
Maximum 24 Hour Average Ambient Temperature	40°C
Conductor Material	Copper
Paint System and Color	Manufacturer's Standard
Auxiliary AC Power Supply	120 Volt
K-Rating for Non-Sinusoidal Loads	As Required for Service
Neutral Grounding	Solid
Unusual Operating Conditions	VFD Input
Special Accessories	Electronic Temperature Monitor
Additional Requirements	Space Heaters

14. Required Bid Submittals:

a. Submittal description.

b. Complete description of proposed transformer.

c. Preliminary outline drawings showing estimated weights, dimensions, and locations of major accessories.

d. Summary description of codes and standards used if different than specified, including a review of major differences.

e. Price list of recommended spare parts.

f. List of special and maintenance tools to be furnished.

g. Bidder experience record with proposed equipment.

h. List of factory routine tests.

i. Complete description of the extent of shop assembly of components.

15. Technical Data:

Technical Data		
Manufacturer		
Factory Location		
Quantity		
Class and Type of Core		
Phase		
Type (Dry, etc.)		
Conductor Material of Each Winding		
kVA, Self-Cooled		kVA
kVA, Force-Cooled (Top Rating)		kVA
High-Voltage Winding		kV
kV BIL		kV BIL
Delta or Wye		
Taps		

Technical Data					
Low Voltage Winding					c'
kV BIL					kV BIL
Delta or Wye					
Taps					
Average Winding Rise-HV					°C
Insulation System Maximum Temperature-HV					°C
Insulation System Maximum Temperature-LV					°C
Cooling Class					
Frequency					
Enclosure-Type					Hz
Impedance					%Z
Vector Group					
Maximum Sound Level					dBA
No-Load Losses					kW
Load Losses					kW
Fan Losses					kW
Efficiency at Unity Power Factor					
At Full Load					
At 85% Load					
At 75% Load					
K-Factor Rating					
Total Weight					
Dimensions, L X W X H		X		X	

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Technical Data	
Efficiency at Unity Power Factor	
HV Winding Description	
LV Winding Description	
Terminal Compartment-Type	
Accessories	

PART F - DIVISION F9

MEDIUM VOLTAGE INDUCTION MOTORS

1. General: This motor specification is applicable to all medium voltage, 3-phase, squirrel-cage induction electric motors.

2. Design and Construction: Motors shall be designed for use with a variable frequency drive. All motors shall be capable of continuous running duty.

   a. Nameplates: All motor nameplate data shall conform to the requirements of the standards listed in this Division. The following additional nameplate data shall be included:

      (1) Insulation system class designation.

      (2) Maximum ambient temperature for which motor is designed and temperature rise by resistance.

      (3) For motors with connections to an external lubricant recirculating system, or with an integral forced lubrication system, oil pressure and oil flow required. The existing motor and fan have an existing lube oil system. The existing motor requires 2.5 GPM at 20 PSIG per bearing. If the new motor requires more lube oil than available, a new lube oil system shall be furnished.

      (4) Type and grade of bearing lubricant, attached adjacent to lubricant filling devices.

      (5) For motors with current transformers for differential protection, connection diagram indicating motor lead terminal connections.

      (6) For motors with air filters, recommended set point for differential pressure device, attached on or near device enclosure.

      All motor nameplates and attachment pins shall be corrosion-resistant metal.

   b. Enclosures: New motors shall match critical dimensions and weight of existing motors as shown on the reference drawings. An adapter sole plate is allowed. Enclosure parts for all motors (e.g. frames, bearing brackets, terminal housings, external fan covers) shall be made of cast iron, cast steel, sheet steel, or steel plates. Aluminum enclosure parts are not acceptable.

Air filters are required and shall be removable from the outside of the motor and from the side only, not from the front or back. Replaceable-type air filters shall be furnished.

Cooling fans, when provided, shall be bi-directional to allow for continuous motor operation in either a clockwise or counterclockwise direction. Specific cases where such a fan is impractical for mechanical reasons shall be brought to the attention of IPSC.

c. Air Filter Pressure Differential Devices: A pressure differential device shall be provided at the air inlet of all motors furnished with air filters. The device shall be furnished with a snap-action sealed switch, having one (1) normally open and one (1) normally closed contact (Form C) which change state (close) on high-pressure differential. The switch shall have an adjustable set point which is accessible for calibration while the motor is in service. The initial adjustment shall be made at the motor supplier's factory. The purpose of the switch is to prevent motor excessive temperature by alarming clogged filters.

d. Insulation and Windings: All stator coils shall utilize copper conductors, shall be form-wound, and shall be insulated with mica based materials. All stator winding materials shall have a Class F (155° C) thermal classification and shall utilize a vacuum pressure impregnation (VPI) system.

Motor windings shall be furnished with a fly ash resistant coating.

e. Temperature Rise: The temperature rises at rated output shall not exceed those for a Class B thermal insulation classification.

f. Space Heaters: All motors shall have space heaters. Heaters shall be located and insulated so they do not damage motor components or finish.

Space heaters shall be sized as required to maintain the motor internal temperature above the dew point when the motor is idle. Space heaters below 1,000 watts shall be rated at 120 volts for use on a 120-volt system. Space heaters 1,000 watts and above shall be rated at 208 volts for use on a 3-phase, 208-volt system.

g. Terminal Housings: A terminal housing for power leads and a separate accessory terminal housing for accessory leads shall be furnished on all motors. The existing motor conduits shall be reused.

All terminal housings shall be externally mounted on the motor frame enclosure. Terminal housings for all motors shall be cast iron or sheet steel. Minimum

protection requirements shall be equivalent to NEMA 4 (IP 54). A Type II motor terminal box shall be furnished.

All motor leads located in the housings shall be permanently marked for ease of identification.

A separate accessory terminal housing shall be provided for space heater leads, temperature detector leads, and other similar accessory equipment leads. It shall be complete with screw-type terminal blocks for termination of such leads. Each terminal in the blocks shall be identified and marked for its respective leads. Accessory terminal housing shall be accessible from outside the motor.

When current transformers for motor differential protection are specified, the current transformers shall be mounted in the power lead terminal housing.

Motor power lead terminal housings shall be large enough to provide working space for the field fabrication of stress relief kits for shielded cable within the housing, and to contain the stress relief kits after fabrication. Type II terminal boxes shall be furnished.

Location and dimensions of terminal housings shall match the existing motor terminal box.

h. Leads: All leads, including motor power leads, space heater leads, and temperature detector leads, shall be wired into their respective terminal housings.

All motors shall have the direction of rotation marked by an arrow mounted visibly on the stator frame near the terminal housing or on the nameplate and the leads marked for phase sequence to correspond to the direction of rotation and supply voltage sequence.

When current transformers for motor differential protection are specified for single-speed motors, the motor phase leads shall be wired to the motor power lead terminal housing for connection for self-balancing current-type differential protection. Each current transformer shall encircle all power leads to the associated winding. The motor winding Wye or Delta connections shall be completed at the factory, leaving only three (3) leads, T1, T2, T3 (U, V, W), for field connection in the power lead terminal housing. The Wye or Delta connection shall be completed in a manner which will allow easy access to the end of each phase for field testing.

Cable motor leads shall utilize stranded copper conductors insulated with silicone rubber covered with a glass braid or acceptable equal.

i. Bearings: The type of bearing furnished shall be determined by the motor supplier based upon the load, speed, and thrust conditions of the driven equipment.

(1) Sliding-Type Bearings: Sleeve bearings for horizontal motors shall be oil ring lubricated-type. The bearings, end bells, and bearing housings shall be split-type when available. Air gap measurement holes or other acceptable means shall be provided in each motor end enclosure for checking air gap of sleeve bearing motors.

(2) Bearing Lubrication System: Motors shall be designed to use the existing pressurized bearing oil system.

(3) Miscellaneous Bearing Requirements: All bearing mountings shall be designed to prevent the entrance of lubricant into the motor enclosure or dirt into the bearings and shall be provided with pipes and drain plugs.

Bearings and bearing housings shall be designed to permit disassembly in the field for inspection of the bearings or removal of the rotor.

All oil-lubricated bearings shall be provided with oil level sight glasses marked for required oil level at motor running and standstill. Plastic sight windows or bottles shall be of a material not adversely affected by continuous exposure to sunlight.

Insulation shall be provided to prevent circulation of shaft current on bearings, on bearing temperature detectors, or on oil piping connections.

Bearing lubricants shall contain a corrosion inhibitor. The type and grade of lubricant shall be indicated on a nameplate attached to the motor frame or end shield adjacent to the lubricant-filling device. Contractor shall verify the existing lubrication system to ensure proper equipment startup and subsequent bearing maintenance.

j. Oil Lubrication Systems: For the existing external lubricant recirculating system, Contractor shall furnish pipe taps for oil inlet and outlet connections in addition to the internal lubricant recirculating system previously specified. The reused lubrication system shall maintain proper lubrication and cooling of the bearings over the complete speed range.

k. Rotors: All induction motors shall have squirrel-cage rotors. Rotors shall be adequately sized to avoid overheating during acceleration of the motor and driven equipment. Rotors shall be copper or copper alloy cage material. All fabricated cage rotors shall include a swaging or wedging method during the installation of rotor bars to prevent rotor bar vibration.

All motor rotating components shall be dynamically balanced after mounting on the shaft. Motor vibration shall not exceed the peak-to-peak amplitude values listed in the following table:

Synchronous Speed, rpm	Maximum Amplitude, Inches, (mm) Peak-to-Peak
999 and below	0.001 (0.025)

In addition, the magnitude of vibration values for twice the line frequency vibrations shall not exceed 0.0005 inches (0.013 mm).

The minimum clearance space required for removal of the rotor shall be indicated both in the Proposal data and on the dimensional outline drawing.

l. Shafts: All shafts shall be solid. Each shaft shall be furnished with a corrosion-resistant treatment or shall be made of a corrosion-resistant material.

The output shafts of motors furnished with sleeve bearings shall be circumscribed with permanent marks indicating the motor magnetic center and end float limits when level and running at rated speed. A permanent, identified reference point shall be indicated or attached to the bearing housing or shaft seal. The markings shall be easily identifiable for use during motor installation.

For horizontal sleeve bearing motors, the rotor end float and coupling end play shall be in accordance with NEMA requirements. The distance from the magnetic center line mark to each end float limit mark shall be not less than 37.5 percent of the total rotor end float.

m. Grounding Pads: External grounding pads shall be provided in at least two (2) locations (near mounting feet at opposite corners).

n. Torque Characteristics: Breakaway, run-up/pull-up, and pull-out/breakdown torque shall at all times be at least 10 percent higher than the load-torque of the driven machine, at minimum specified starting voltage. Load-torque characteristics are specified in Medium Voltage Variable Frequency Drives, Division F7, and as shown on the speed torque curve in Figure 3.3,

page F7-25; however, the responsibility for successful starting under the given conditions rests with the motor manufacturer.

o. Quality Control Tests and Inspections: Each motor shall be tested and inspected at the manufacturer's factory to determine that it is free from electrical or mechanical defects and to provide assurance that it meets the requirements of these Specifications. Test procedures shall be in accordance with IEEE or NEMA test procedures for 3-phase induction motors.

Copies of reports of the quality control tests and inspections for each motor shall be submitted prior to shipment of the motor from the manufacturer's factory.

The routine tests listed in NEMA shall be performed on each motor. One of the motors shall have complete test in accordance with IEEE Standard 112.

Additional tests shall be performed to determine the efficiency and power factor for each motor.

p. Drawings and Engineering Data: Motor dimensional drawings shall include the following information in addition to the requirements listed in these Specifications:

(1) Complete nameplate data.

(2) Rotor weight and motor total weight.

q. Couplings: The motor shaft shall be designed so the existing motor half coupling can be transferred to the new motor and reused. The existing coupling shall be reconditioned so the existing vibration dampening materials are replaced with new. Contractor has the option of furnishing a new coupling. If a new coupling is being proposed Contractor shall provide coupling information in the Proposal data.

r. Sole Plates: Existing sole plates shall be used; however, if an adapter plate is required, Contractor shall furnish one that can be bolted directly to the existing sole plate. Contractor shall provide adapter information as part of the Proposal.

s. Critical Speeds: Motors shall be designed to keep torsional and rotational natural frequencies of vibration at least 25 percent above, the motor rated speed ranges to avoid resonant vibration over the operating speed range of the equipment-motor unit.

t. Vibration Transducer Mounting: A vibration transducer mounting for field installation of an IPSC-furnished vibration transducer shall be provided on the

drive shaft bearing housing of the motor. The vibration transducer and monitoring equipment will be furnished under separate specifications.

3. Scope of Supply: Provide squirrel-cage induction motors for configurations in which existing motors are not suitable.

4. Scope of Erection/Construction: Motors must be constructed to replace existing motors on the existing foundation and on existing sole plates and all conduits. Contractor shall include a detailed description of Work required to mate new motor with existing fan and motor foundation. The written Work description shall be submitted for review with the motor dimensional drawings, and included in the instruction manuals. The Work description shall be of sufficient detail to provide the installing contractor with all information needed to install the new motors and modify any of the existing equipment.

5. Schedule of Contract Submittals:

Submittal Item Activity	**To Be Received No Later Than... Days After Award of Contract**
Power Factor and Efficiency Versus Percent Load Curves for Medium Voltage Motors	15
Motor Dimensional Drawings	15
Wiring Diagrams	30
Motor Nameplate Data	20
Medium Voltage Motor Rotor Removal Clearance Drawings	15
Bearing Disassembly and Reassembly Drawings	With Instruction Manual

6. Performance and Design: This motor data sheet is applicable for motors with nameplate ratings:

Driven Equipment		IPSC Tag Number		Quantity
ID Fan		1CCE-FAN-1A		1
Minimum Output Rating				
NEMA (HP)	**Service Factor**	**IEC (kW)**	**Synchronous Speed (RPM)**	**Direction of Rotation***
8,700	1.15	N/A	900**	CW/CCW

* Direction of shaft rotation shall be viewed from motor end opposite the motor output shaft and looking at the driven equipment. Contractor to coordinate direction of rotation existing ID Fan.

** Motors shall be designed to operate continuously at 1050 RPM.

Horizontal Shaft Mounting Arrangement - Horizontally Mounted Motor	
NEMA Motor	Horizontal, Single Shaft Extension
Rated Voltage (volts)/Frequency (hertz)	As Required
Maximum Ambient Temperature (°C)	50
Minimum Ambient Temperature (°C)	-35
Altitude	4,700 Feet
Efficiency, Minimum	High Percent

Motors shall be manufactured to NEMA/ANSI Standards.

a. Features: The following features shall be provided:

Feature	NEMA
Enclosure/Degree of Protection	WP II
Enclosure Openings Shall be Covered with Screens Manufactured from the Following Materials	Stainless
Air Filters	Replaceable

Feature		NEMA
No-Load Sound Produced by the Motor at one (1) Meter		80 dBA
Current Transformers		If Required
Stator Winding Temperature Devices		RTDs - 10 OHM - Copper (Two [2] per Phase per Winding)
Starting Voltage Range	Minimum **VFD** Percent	Minimum **VFD** Percent
Incoming Power Supply Cable and Terminations		Must Match Existing Cables or Cables Required to Fit Existing Conduits
Anti-Condensation Space Heaters		Space Heater Shall be Provided
Space Heaters Shall be Energized at		120 V for volt Heaters, 1,000 W and 208, 3Ø for Heaters 1,000 W and Above

b. Dollar Value: The following dollar value shall be used to evaluate motor energy losses at driven equipment maximum brake horsepower (kW) as defined on the Motor Proposal Data Sheet:

Dollars (US)/kW
$1,275

c. Horizontal Motors:

Horizontal Motors	
Sole Plates	Use Existing Sole Plates
Terminal Box Location, Viewed From Motor End Opposite the Motor Output Shaft	Match Existing
Horizontal Motor Bearing-Type	Sleeve Bearings Forced Oil Lubricated

Bearings		
Bearing Temperature Detectors Shall be Furnished	On Each Motor Sleeve Bearing	
Bearing Temperature Detectors	Type E Thermocouple	
Bearing Lubrication System	Oil Rings	
Bearing Lubrication System Cooling	Existing	
Driven Equipment Characteristics		
Driven Equipment Inertia	wk^2 - lb ft^2	388,240
Synchronous Speed Required Torque	954 rpm	
Starting Load	Fan-Dampers Closed	

7. Additional Requirements:

a. Special Requirements: Special requirements beyond the established standards have been defined for this Project.

Provided below are technical exceptions to, or deviations from, the requirements specified in the associated Technical Specifications for the equipment or service. These exceptions and deviations shall govern over the standard specifications only to the extent of the difference.

b. Codes and Standards: Work performed under these Specifications shall be done in accordance with the following codes and standards. The version that is latest adopted, published, and effective at the date of this Contract shall apply unless specifically stated otherwise. These references shall govern the Work except where the references conflict with IPSC Specifications. In cases of conflict, the latter shall govern to the extent of such difference.

Codes and Standards
NEMA MG1
ANSI C50.41
IEEE 112
IEEE 522

c. Approved Manufacturers:

For the following components, only the listed manufacturers are recognized as maintaining the level of quality or workmanship required by these Specifications. If Contractor wants to propose a non-listed manufacturer that is considered to provide an equivalent level of quality, the manufacturer must be identified and supporting testimony provided. Acceptance of the manufacturer as a substitute is at the discretion of IPSC.

Component	Approved Manufacturer
Medium Voltage Induction Motors	ABB Electric Machinery General Electric Reliance Siemens TECO - Westinghouse Motor Co. Toshiba

8. Required Bid Submittals: The following data shall be submitted for use in the evaluation of bids. The Proposal will be considered incomplete until the required submittals are received.

a. Submittal description.

b. Overall size, weight, and configuration for each motor and arrangement of accessory items.

c. Overall drawing showing center lines and major dimensions of each motor and minimum clearance space required for removal of the rotor shall be indicated on the dimensional outline drawing.

d. Efficiency versus percent load curves.

e. Power factor versus percent load curves.

f. If a new coupling is being proposed, provide coupling information, manufacturer, and type.

g. If an adapter plate is being proposed, provide adapter information, size, and dimensions.

h. Motor thermal limit curves.